

EXHIBIT 4

Exhibit 5 to Plaintiffs' Opposition to Motion to Exclude Testimony of
Craig Rosenberg (ECF No. 302)

Exponent®

**In Re FCA US LLC
Monostable Electronic
Gearshift Litigation**

Project No. 1804638.000

**Report of Douglas Young, Ph.D.
and David Cades, Ph.D.**



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Litigation
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Prepared for:

Fred Fresard, Esq.
Dykema Gossett PLLC
39577 Woodward Avenue, Suite 300
Bloomfield Hills, MI 48304

Prepared by:

Douglas Young, Ph.D.
Exponent
5401 McConnell Ave.
Los Angeles, CA 90066

David Cades, Ph.D.
Exponent
525 W. Monroe St., Suite 1050
Chicago, IL 60661

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Figure 6. Go Pro Setup in Vehicles. Four Go Pros were placed in each vehicle to monitor the 1) dashboard, 2) windshield, 3) driver, and 4) gearshift throughout the study. Pictured is the set up in the Jeep Grand Cherokee.

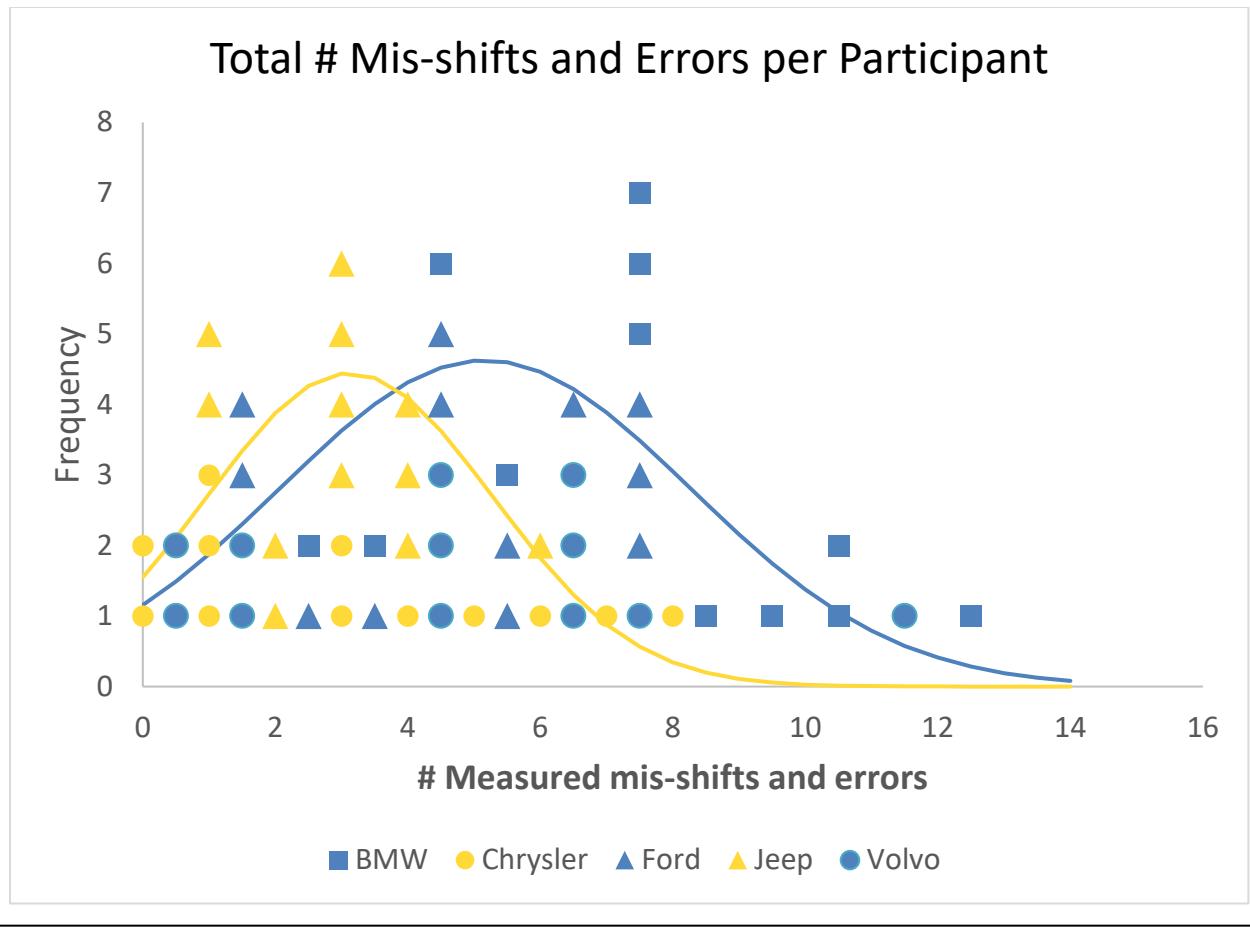


Figure 16. Total mis-shifts and errors per participant. Total number of measured corrected mis-shifts, “forget to shift” and “late to shift” errors for each participant.

Comparison to Lextant clinics and Dr. Rosenberg’s testing.

All of our study participants were experienced drivers who drove their assigned vehicle at least once per week and were thus familiar with the gearshift. Given their experience, our participants were more similar to the class members than those participants in the aforementioned studies which included drivers naïve to the gearshift. Unlike participants in the Lextant clinics and in Dr. Rosenberg’s testing, our use of experienced participants controls for any novelty effects – it is not uncommon for people to need time to learn a new technology.³⁸⁸ As described above, Dr. Rosenberg claims to have had experienced drivers in his study, but only four of his participants reported to have owned a vehicle with a monostable gearshift, and even those four did not verify that their monostable gearshift was the same as the gearshift in the class vehicles.³⁸⁹

In contrast with both the Lextant clinics and Dr. Rosenberg’s testing, we evaluated various gearshift behaviors using precise objective techniques by way of our instrumentation that enabled

³⁸⁸ Shinar et al., 1998

³⁸⁹ Rosenberg Report, p. 33

us to detect the gear selected, force used, and displacement, at the resolution of one millisecond. These techniques necessarily are not subjective or open to interpretation. We used this information along with our Go Pro footage to fully characterize and define each shift that we evaluated. This precision is unmatched in both the clinics and in Dr. Rosenberg's work, and removes the element of subjectivity when characterizing gearshift behavior by way of solely relying on visual observations of the experimenter and subsequent review of videos of participant performance.³⁹⁰ Furthermore, we explicitly defined each shifting behavior so as to be mutually exclusive of one another; we did not ever categorize one participant's single maneuver into two separate gearshift behaviors or errors and were thus careful to not over- or under-include shifting metrics. This is in direct contrast to Dr. Rosenberg's technique, in which a single task can be subjectively judged as having multiple co-occurring errors.³⁹¹

Furthermore, we chose to measure errors that could be objectively determined. Both the Lextant clinics and Dr. Rosenberg's study chose to measure "undershoot errors" in which the participant stops at the gear prior to entering the intended gear. However, there is no way to properly distinguish between participants who believed they were in the correct gear and then chose to immediately shift to the next gear, or participants who were merely shifting between gears to arrive at the intended gear.

Our study included appropriately representative experimental control vehicles, picked as likely alternative vehicles that class members may have considered at the time of their purchase or lease of their vehicles or were similar in size, class and type. Dr. Rosenberg chose a 2019 Jeep Cherokee as his control vehicle, which is an entirely different model of vehicle and would not yet have been on the market, or have been a viable alternative, at the time class members would have purchased or leased their vehicle.

North Carolina State Accident Report Database Analysis

In order to evaluate the overall incidence and relative rates of rollaways that occur in the class vehicles, we conducted an analysis of rollaway-related accident reports involving the 2012-2014 Chrysler 300, 2012-2014 Dodge Charger, and 2014-2015 Jeep Grand Cherokee ("class vehicles"³⁹²), as well as peer vehicles representing a range of manufacturers.

The analysis was based upon reports of accidents documented in the North Carolina Accident Report Database (NCDB). The NCDB is a detailed database maintained by the State of North Carolina Department of Motor Vehicles. The database is used by the Federal Highway Administration (FHWA) in conjunction with its Highway Safety Information System, and its

³⁹⁰ Rosenberg Report, pp. 23-24, 28

³⁹¹ E.g., Rosenberg Raw Data (EXP_ROSEN_000015) Tasks Worksheet, Subject 1 Data

³⁹² These make and model year combinations represent the "class vehicles" for the purposes of the analyses described in this section; however, we cannot rule out that the dataset includes 2012-2014 Chrysler 300s and Dodge Chargers that were not equipped with the subject monostable shifter.